

Technology Opportunity

Sensors – Physical

Accurate Location of Lightning Strikes – Sonic Lightning Locator (SOLLO 1)

The National Aeronautics and Space Administration (NASA) seeks to license its Accurate Location of Lightning Strikes technology. The system, known as the Sonic Lightning Locator (SOLLO 1), was developed at the John F. Kennedy Space Center, FL, to determine the precise ground strike point of lightning within a 1-mile radius of the sonic sensor-networked locator, compensating for wind conditions. This capability is beneficial to facilities with high-tech, expensive equipment in assessing potential damage due to electrical strikes.

This new technology, which is able to discriminate individual strikes from each other, can benefit many users, including insurance companies and policyholders, utilities, airports, government agencies, amusement parks, and golf courses, with more precise lightning strike information. SOLLO 1 offers an inexpensive, easy-to-use flexible configuration and requires minimal maintenance.



Potential Commercial Uses

- Insurance companies and policyholders
- Airports
- Golf courses
- Amusement parks
- Power utilities
- Hazardous materials storage

Benefits

- Proof of lightning damage for insurance claims
- Defines lightning attraction areas
- Aids in evaluating damage to expensive electronic equipment
- Provides real-time information on lightning conditions



The Technology

SOLLO 1 consists of a network of one electric field antenna and three or more sonic sensors separated from each other by several hundred feet and located at different places within the perimeter of a 1-mile area. The leading edge of the electric field pulse detected in each receiver is used to start a timer, and the leading edge of the thunder pulse (sonic wave) arriving at the same receiver is used to stop the timer.

When lightning strikes, a micro-controller at each receiving location is used to measure the time difference between the arrival of the electric field pulse and the arrival of the sonic wave. This measurement defines a circle, with one sensor in the center, where the strike may occur. A second sensor at a different location, using the same type of measurement, also has a circle defined around it. These two circles would intersect at the most in two points. With the addition of a third sensor, all uncertainties are eliminated and a single striking point is determined. The timing information from each sensor is transmitted back to a central computer where it is processed to obtain the location of the lightning strike. Using more than three receivers can enhance the accuracy of the system.

This system provides the user with details of mathematical solution and associated statistics for strike location regardless of the presence of wind, with or without wind data. It estimates the errors in the estimation of location, along with the wind speed and direction estimations, enhancing the accuracy and usefulness of the SOLLO 1 system.

Options for Commercialization

NASA seeks qualified companies to commercialize the Sonic Lightning Locator (SOLLO 1). This and other technologies are made available by the KSC Technology Commercialization Office through a variety of licensing and partnering agreements. These include patent and copyright licenses, cooperative agreements, and reimbursable and nonreimbursable Space Act Agreements.

Contact

If your company is interested in the Sonic Lightning Locator technology or if you desire additional information, please reference Case Number KSC-11992 and contact:

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Commercialization Checklist

- ✓ Patent pending
 - U.S. Patent
 - Copyrighted
- ✓ Available for licensing
 - Available for no-cost transfer
 - Seeking industry partner for further codevelopment

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